IXYS

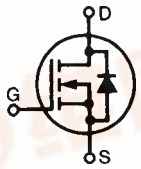
Advanced Technical Information

HiPerFET™ Power MOSFETs ISOPLUS247™ Q CLASS

(Electrically Isolated Back Surface)

	V_{DSS}	I_{D25}	$R_{DS(on)}$
IXFR 12N100Q	1000 V	10 A	1.05 Ω
IXFR 10N100Q	1000 V	9 A	1.20 Ω
	$t_{rr} \leq$ 200 ns		

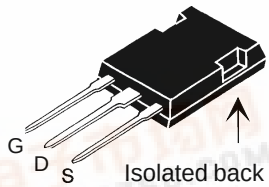
N-Channel Enhancement Mode
Avalanche Rated, High dV/dt
Low Gate Charge and Capacitances



Symbol	Test Conditions		Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C		1000	V
V_{DGR}	T_J = 25°C to 150°C; R_{GS} = 1 MΩ		1000	V
V_{GS}	Continuous		±20	V
V_{GSM}	Transient		±30	V
I_{D25}	T_C = 25°C	12N100	10	A
		10N100	9	A
I_{DM}	T_C = 25°C, Pulse width limited by T_{JM}	12N100	48	A
		10N100	40	A
I_{AR}	T_C = 25°C	12N100	12	A
		10N100	10	A
E_{AR}	T_C = 25°C		30	mJ
dv/dt	$I_S \leq I_{DM}$, di/dt ≤ 100 A/µs, $V_{DD} \leq V_{DSS}$ $T_J \leq$ 150°C, R_G = 2 Ω		5	V/ns
P_D	T_C = 25°C		250	W
T_J			-55 ... +150	°C
T_{JM}			150	°C
T_{stg}			-55 ... +150	°C
T_L	1.6 mm (0.063 in.) from case for 10 s		300	°C
V_{ISOL}	50/60 Hz, RMS t = 1 min		2500	V~
Weight			5	g

Symbol	Test Conditions		Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
V_{DSS}	V_{GS} = 0 V, I_D = 3mA		1000			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 4mA		2.5		5.5	V
I_{GSS}	V_{GS} = ±20 V_{DC}, V_{DS} = 0				±100	nA
I_{DSS}	V_{DS} = 0.8 • V_{DSS}	T_J = 25°C			50	µA
	V_{GS} = 0 V	T_J = 125°C			1	mA
$R_{DS(on)}$	V_{GS} = 10 V, $I_D = I_T$	12N100			1.05	Ω
	Notes 1 & 2	10N100			1.2	Ω

ISOPLUS 247™



G = Gate D = Drain
S = Source

* Patent pending

Features

- Silicon chip on Direct-Copper-Bond substrate
  - High power dissipation
  - Isolated mounting surface
  - 2500V electrical isolation
- Low drain to tab capacitance(<50pF)
- Low $R_{DS(on)}$ HDMOS™ process
- Rugged polysilicon gate cell structure
- Unclamped Inductive Switching (UIS) rated
- Fast intrinsic Rectifier

Applications

- DC-DC converters
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- AC motor control

Advantages

- Easy assembly
- Space savings
- High power density

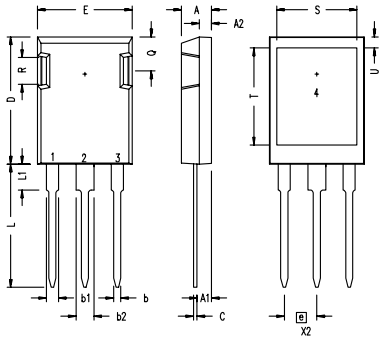
Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
g_{fs}	V_{DS} = 15 V; $I_D = I_T$ Note 1	4	10		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		2900		pF
C_{oss}			315		pF
C_{rss}			50		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, $I_D = I_T$ R_G = 1 Ω (External),		20		ns
t_r			23		ns
$t_{d(off)}$			40		ns
t_f			15		ns
$Q_{g(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, $I_D = I_T$		90		nC
Q_{gs}			30		nC
Q_{gd}			40		nC
R_{thJC}				0.50	K/W
R_{thCK}			0.15		K/W

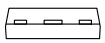
Source-Drain Diode

Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
I_S	V_{GS} = 0 V			12	A
I_{SM}	Repetitive; pulse width limited by T_{JM}			48	A
V_{SD}	$I_F = I_S$, V_{GS} = 0 V, Note 1			1.3	V
t_{rr}	$I_F = I_s$, -di/dt = 100 A/µs, V_R = 100 V		200		ns
Q_{RM}			1.6		µC
I_{RM}			7		A

Note: 1. Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %
2. I_T test current: IXFR10N100 I_T = 5A
IXFR12N100 I_T = 6A

ISOPLUS 247 (IXFR) OUTLINE





1 Gate, 2 Drain (Collector)
3 Source (Emitter)
4 no connection

Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	4.83	5.21	.190	.205
A_1	2.29	2.54	.090	.100
A_2	1.91	2.16	.075	.085
b	1.14	1.40	.045	.055
b_1	1.91	2.13	.075	.084
b_2	2.92	3.12	.115	.123
C	0.61	0.80	.024	.031
D	20.80	21.34	.819	.840
E	15.75	16.13	.620	.635
e	5.45 BSC		.215 BSC	
L	19.81	20.32	.780	.800
L1	3.81	4.32	.150	.170
Q	5.59	6.20	.220	.244
R	4.32	4.83	.170	.190
S	13.21	13.72	.520	.540
T	15.75	16.26	.620	.640
U	1.65	3.03	.065	.080